

How to build a crystal radio

The simplest radio receiver ever existed... and it does not use batteries!

Learning targets: Acquire manual skills in building simple electrical circuits.

Material:

For each radio:

- Cardboard or PVC cylinders, about 10 cm in diameter
- Unipolar wire (12 m)
- short wires with "crocodile" connectors
- enamelled copper wire, 0.5 mm diameter.
- Variable capacitor, 350-400 pF
- 47 k Ω resistor
- Germanium diode (eg. OA91, 1N34)
- High impedance (>1 k Ω) or piezoelectric earphones; if the earphones cable is terminated by a jack, provide a suitable plug.
- Wooden or plastic support for the circuit
- Sandpaper
- Nippers
- Soldering iron and relative accessories (preferred) or "mammoth connectors" or clips.

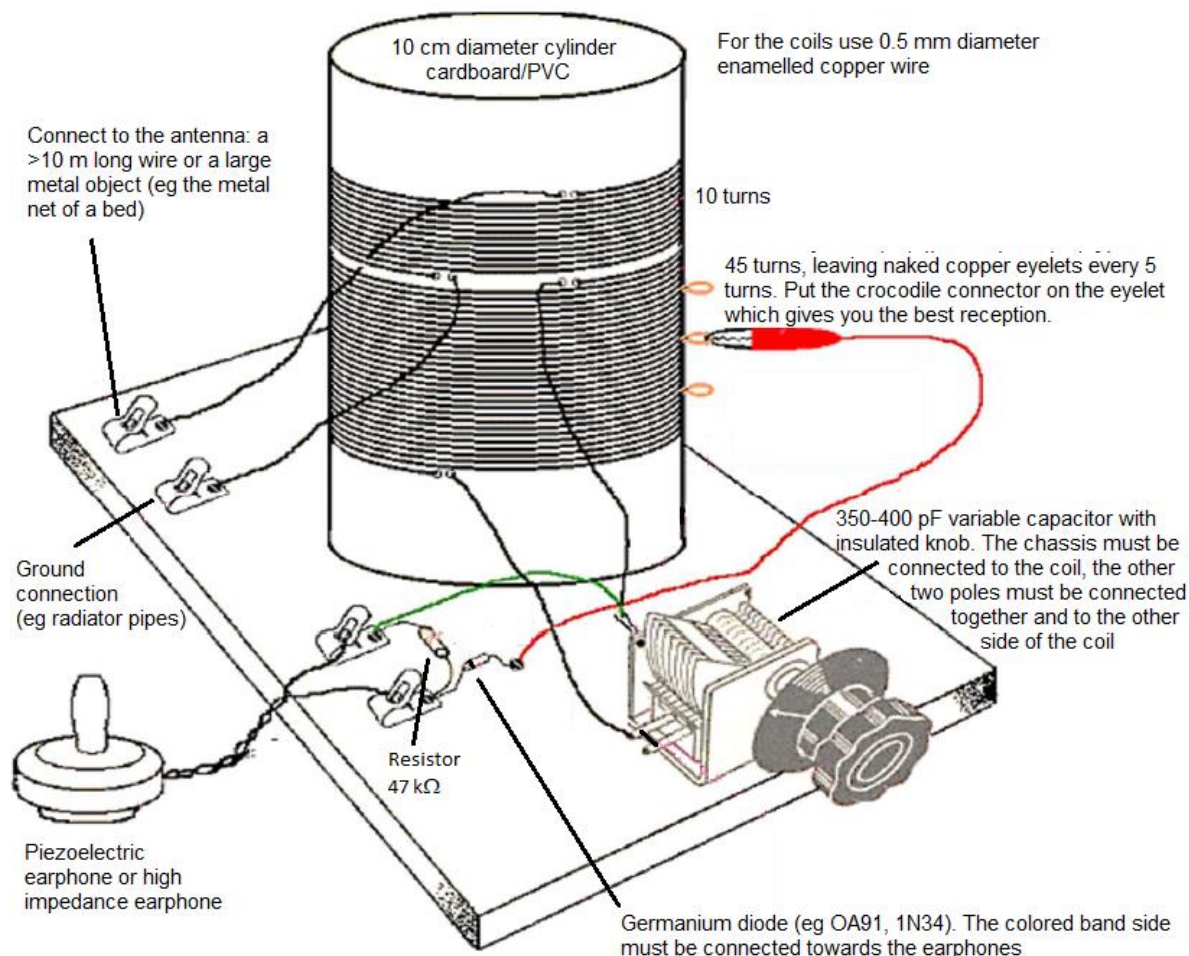
The electronic components can be easily found over the Internet or in an electronics fair.

Time and preferred place: 1-2 hours. The building of the receiver can be done in almost any place. If the soldering irons are used, 110/220 V sockets should be available. To use the radios, an open space of some tens of meters should be available.

Description: Believe it or not, it's possible to build a radio receiver that works without batteries! The so-called crystal radio uses the only energy of radio waves to work; it can receive broadcasting radio stations in medium wave range (MW, 526 kHz -1626 kHz). The radio needs a long wire (>10 m) to collect radio signals and ground connections. Don't use the ground pole of 110/220 V sockets, but connect to radiator pipes. In a scout/guide camp, you can realize a ground connection by putting a long metal pole or a metal net in a wet ground.

For a practical demonstration to an audience, you can use PC active loudspeakers in place of the earphones.

Crystal radios can be used at the camp to remain updated on the news from the world or on the weather forecasts..



An alternative with no antenna and ground connection: On a square support of 50-60 cm side length (even a extra large pizza box could be ok) create two windings, one of 4 turns the other of 12 turns. The first winding must be connected to the diode, resistor and earphones, the other one must be connected to the variable capacitor. In this crystal radio the windings are so large that directly collect the radio waves.



Many other crystal radio projects can be easily found over the internet.